

# LIE-DOWN MASSAGER

By

Hakjin KIM

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## BACKGROUND OF THE INVENTION

The invention relates generally to a massaging device. More particularly, the present invention relates to an improved lie-down massager capable of efficiently treating bodily malfunctions such as back pain and  
10 gastrointestinal weakness by applying a therapeutic massaging treatment along the back and neck of a patient lying down on the massager whose massaging bumps move horizontally and vertically along the patient's spinal cord and neck in which the vertical movement of the  
15 massaging bumps optimally coordinates with a widthwise reciprocation to repeatedly approach to and distance from each other.

Conventional bed or mat type massaging devices employ a spring mechanism for vertically moving massaging  
20 bumps. As disclosed USP 6,454,732, a spring mechanism allows the massaging bumps to gently move up and down. However, when it comes to therapeutic effects, the spring mechanism proves too soft to push up the massaging bumps when stronger pressure is required, because tension of

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springs applies equally to patients lying on the  
massaging device regardless of patient's requirements.

A demand is to adopt a reliable mechanism  
demonstrating a steady and robust therapeutic effects  
5 while harmonizing the vertical movement with a widthwise  
reciprocation between the massaging bumps.

### **SUMMARY OF THE INVENTION**

The present invention is contrived to overcome the  
10 conventional disadvantages. Accordingly, an object of the  
invention is to provide a lie-down massager that improves  
therapeutic effects by harmonizing a vertical  
reciprocation with a widthwise reciprocation of massage  
bumps.

15 Another object is to optimize spinal and neck  
massage effects by allowing the massage bumps to  
repeatedly become near to and away from each other,  
thereby enabling patients to receive a widespread massage  
along the backs and necks of the patients. A further  
20 object is to improve product reliability and customer  
satisfaction by reliably synthesizing vertical,  
lengthwise and widthwise reciprocations of the massage  
bumps.

To achieve these and other objects, the lie-down  
25 massager according to the present invention comprises a

base frame having an elongated top panel with an elongated top opening formed centrally and lengthwisely through the elongated top panel. A rider is provided below the elongated top panel of the base frame to make a horizontally reciprocal movement relative to the base frame, and a lifter liftedly engaged to the rider to make a vertically reciprocal movement relative to the rider. A massage member is fixed downwardly to the lifter, and first and second supports are horizontally aligned along a top portion of the massage member. Another member is also provided for allowing the first and second supports to repeatedly approach to and distance from each other within the elongated opening. Here, massage bumps attached atop the first and second supports, and a pad covering the massage bumps and the elongated opening of the base frame.

In an embodiment, a pair of pulleys are linked by a rope and respectively mounted in a front end portion and a rear end portion of the base frame so that a predetermined portion of the rope is fixedly attached to the rider. In this construction, the pulley rotation enables the rider to generate a horizontally reciprocal movement along the elongated top opening. Alternately, there may be provided a pair of rack gears parallel to each other and provided below the elongated top panel

where a rider is provided with a roller gear  
perpendicular to the rack gear so that the roller gear is  
rotatably mounted on the rack gears to allow the rider to  
make a horizontally reciprocal movement along the rack  
5 gears. Preferably, the rider is maintained below the  
elongated top panel.

The massager further includes a pair of roller  
coasters provided parallel to each other and attached to  
the base frame to each have a substantially waved top  
10 surface, and a coasting member liftedly engaged between  
the lifter and the rider where a coaster guide roller is  
formed outwardly extending from each side surface of the  
coasting member. The coaster guide roller enables the  
coasting member to make a roller coasting movement on and  
15 along the waved top surfaces of the roller coasters.  
Elongated guides downwardly extend from the coasting  
member, and guide bushes are upwardly formed on the rider  
to releasably receive the elongated guides so as to  
stabilize the roller coasting movement of the coasting  
20 member along the roller coasters and the lifting of the  
coasting member from the rider.

A gear shaft is rotatably engaged to the massage  
member and partitioned to first and second halves  
respectively threaded symmetrical to each other such that  
25 the first support carried on the first half either

approaches to or distances from the second support  
carried on the second half of the gear shaft in  
accordance with a rotating direction of the gear shaft  
where a first motor connected to the gear shaft to  
5 control the rotation of the gear shaft. Also, rider guide  
rollers are provided on each side of the rider to become  
rollably engaged in the base frame to guide the  
horizontally reciprocal movement of the rider. In a  
better version, the first and second supports repeatedly  
10 approach to and distance from each other in perpendicular  
to the horizontally reciprocal movement of the rider. The  
vertical reciprocation of the lifter is preferably  
implemented by a gear-motor application, a gear-chain  
mechanism or a cam-motor application.

15       The massage bumps each formed in hemisphere are  
partitioned to first and second pairs where the first  
pair massage bumps are formed atop the first support and  
the second pair massage bumps are formed atop the second  
support. Here, each pair bumps are aligned parallel to  
20 the direction of the rider reciprocation. The massage  
bumps each include a heater that is a heating lamp  
generating heat and infrared rays.  
A heating member is selectively spread in the top panel  
of the base frame.

Advantages of the present inventions are numerous.  
Most of all, the lie-down massager according to the  
present invention optimally combines a lengthwise  
reciprocation of massage bumps with a vertically  
5 reciprocal movement and with a widthwise reciprocation of  
the massage bumps for thereby enabling an evenly  
widespread massaging on the back and neck of a patient  
lying on the massager.

Further, the combination of the triple  
10 reciprocations results in a conspicuous therapeutic  
effects by realizing a virtually total back massaging  
while lying on the bed or mat type massager. Also, the  
massager maximally synthesizes multiple reciprocations in  
the movement of the massage bumps while relaxing on the  
15 bed or mat type massager, thereby enhancing product  
reliability and customer satisfaction.

Although the present invention is briefly summarized,  
the full understanding of the invention can be obtained  
by the following drawings, detailed description and  
20 appended claims.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

These and other features, aspects and advantages of  
the present invention will become better understood with  
25 reference to the accompanying drawings, wherein:

FIG. 1 is a perspective view showing a mechanism of a lie-down massager according to the present invention;

FIG. 2 is a view showing the lie-down massager with a patient lying thereon according to the present invention;

FIG. 3 is a plan view showing the lie-down massager without the patient in FIG. 2;

FIGS. 4A-4D are views showing vertical and widthwise reciprocations implemented in the present invention;

FIG. 5 is a perspective view showing an embodiment of the present invention; and

FIGS. 6A-6F are views showing applications of a lifter in the present invention.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

FIG. 1 shows a brief construction of a lie-down massager **10** according to a preferred embodiment of the present invention. FIG. 2 shows the lie-down massager **10** with a patient lying thereon, and FIG. 3 shows a plan view of the massager **10** excluding the patient. As shown therein, the lie-down massager **10** includes a base frame **12** in a bed type or a mat type. The base frame **12** includes an elongated top panel **14** with a heating member **15** spread in the top panel **14** to further comfort the patient on the massager **10**. An elongated opening **16** is

formed centrally and lengthwisely through the elongated top panel 14. The heating member 15 is preferably formed around the elongated opening 16 to generate heat rays at a predetermined temperature. The massager 10 includes a rider 18 and a lifter 20. The lifter 20 is liftedly engaged to the rider 18 to make a vertically reciprocal movement relative to the rider. The rider 18 is provided below the elongated top panel 14 of the base frame 12 to make a horizontally reciprocal movement relative to the base frame 12. Here, a guide member 22 is movably engaged between the base frame 12 and the rider 18 so as to enable the rider 18 to make a horizontally reciprocal movement along the elongated top panel 14. Here, the guide member 22 may be formed of either a rope-pulley mechanism in FIG. 1 or a rack gear mechanism in FIG. 5.

To improve massaging effects, a massage member 24 is fixed downwardly to the lifter 20. Along a top portion 26 of the massage member 24 are horizontally aligned first and second supports 28, 30. There is also provided a means 32 for allowing the first and second supports 28, 30 to repeatedly approach to and distance from each other within the elongated opening 16. The means 32 includes a gear shaft 34 rotatably engaged to the massage member 24 and partitioned to first and second halves 33, 35 respectively threaded symmetrical to each other by a

shaft center **36** such that the first support **28** carried on  
the first half **33** either approaches to or distances from  
the second support **30** carried on the second half **35** of  
the gear shaft **34** in accordance with a rotating direction  
5 of the gear shaft **34**. The shaft center **36** is connected to  
a first motor **38** to control the rotation of the gear  
shaft **34**, preferably by a belt **40**. The belt **40** may be a  
timing belt, and the first motor **38** may be a geared motor.

Selectively, the means **32** may be a pinion-rack  
10 mechanism where a pinion engaged to a motor controls a  
relative movement of rack gears connected to the supports  
**28, 30** so that a bi-directional rotation of the pinion  
gear enables the supports **28, 30** to repeatedly approach  
to and distance from each other. The means **32** may also be  
15 implemented by adopting a spring restitution for the  
approaching motion and a gear-motor mechanism for the  
distancing motion of the supports **28, 30**.

In order to implement a therapeutic massage  
operation, a plurality of massage bumps **42** are attached  
20 atop the first and second supports **30**. The massage bumps  
**42** are provided to move along the elongated opening **16** of  
the elongated top panel **14** of the base frame **12**. So the  
massage bumps **42** are directed to massage the back and  
neck of the patient lying on the top panel **14** of the base  
25 frame **12**. Here, a pad **44** may be provided to cover the

message bumps **42** and the elongated opening **16** of the base frame **12**. The message bumps **42** are preferably partitioned to first and second pairs so that the first pair bumps are aligned parallel to the second pair bumps. The  
5 message bumps **42** may each include a heater **46** preferably in form of a heating lamp. Selectively, the heating lamp for the heater **46** may be formed to generate heat and infrared rays to maximize therapeutic effects. In a preferred version, the message bumps **42** are each formed  
10 in hemisphere. Specifically, the message bumps **42** are partitioned to first and second pairs, wherein the first pair message bumps are formed atop the first support **28** and the second pair message bumps are formed atop the second support **30** so that each pair bumps **42** are aligned  
15 parallel to the direction of the rider reciprocation.

As shown back in FIG. 1, the massager **10** optimally combines a plurality of reciprocal movements. First, the rider **18** makes a lengthwise reciprocation along the top panel **14**, for example, by a pulley mechanism (**AA**) so that  
20 the message bumps **42** to progressively massage along the back and neck of the patient lying on the massager **10**. Second, the rider **20** serves to make a vertical reciprocation (**BB**) so as to efficiently control the push-up of the message bumps **42** on the back and neck of the  
25 patient, whereby the patient is allowed to optimize the

push-up or upward pressure of the massage bumps 42 depending on the patient.

For example, a skinny woman with a back pain feels painful when the massage bumps 42 pushes up or massage  
5 her back to an extent in which a masculine man feels appropriate. Third, the massage bumps 42 make a horizontally reciprocal pulsation alternately moving toward or away (CC) from each pair bumps 42 so that the massage bumps 42 become evenly applied to a patient's  
10 back portion between the spinal cord and sides. Further, since each of the three reciprocations are motor-powered, the user can easily control each reciprocal operation, for example, by using a hand-held control (not shown). That is, the first and second supports 28, 30 become  
15 approached to and distanced from each pair massage bumps 42 in accordance with the first motor 40, the lifer 20 is controlled by a second motor 48, and the rider 18 is controlled by a third motor 50.

FIGS. 4A-4D respectively show a relative mechanism  
20 of the lifter 20 and the massage member 24. As shown therein, while the lifter 20 makes an upward or downward stroke, the first and second supports 28, 30 either approach to or distance from each other depending upon the patient's control. Specifically, the first and second  
25 supports 28, 30 repeatedly approach to and distance from

each other in perpendicular to the horizontally  
reciprocal movement of the rider 18. As an example in FIG.  
4A, a roller gear 52 powered by the second motor 48 is  
engaged to a rack gear 54 to vertically reciprocate the  
5 lifter 20. Likewise, in order to implement the vertical  
reciprocation, the lifter 20 may employ a mechanism  
selected from a pinion-rack mechanism powered by a motor,  
a gear-motor application, a gear-chain mechanism powered  
by a motor, a cam-motor application, and other vertical  
10 reciprocation applications as illustrated in FIGS. 6A-6F.  
That is, FIGS. 6A, 6B and 6E are examples of gear-applied  
lifter 20, and FIG. 6C employs a cam 21 to generate a  
vertically reciprocal movement of the lifter 20. FIG. 6F  
shows the lifter 20 employing a combination of a gear set  
15 23 and a chain 25 for the vertical reciprocation of the  
lifter 20.

In order to facilitate the lengthwise reciprocation  
of the rider 18, the guide member 22 may be incorporated  
in a pair of pulleys 56 linked by a rope 58 and  
20 respectively mounted in a front end portion 60 and a rear  
end portion 62 of the base frame 12. A predetermined  
portion 63 of the rope 58 is fixedly attached to the  
rider 18 so that the pulley rotation enables the rider 18  
to generate a horizontally reciprocal movement along the  
25 elongated top opening 16. There is also provided the

pulley motor 50 that controls one of the pulleys 56. In a preferred version, the pulley motor 50 is provided adjacent to the pulley 56 provided in the rear end portion 56 of the base frame 12. Preferably, the pulleys 56 are relatively twisted by 90 degrees against each other to facilitate the horizontal reciprocation of the rider 18.

Meanwhile, as shown in FIG. 5, when the guide member 22 is incorporated in the rack gear mechanism, the guide member 22 comprises a pair of side rack gears 66 parallel to each other and lengthwisely provided below the elongated top panel 14 of the base frame 12, a roller gear 68 perpendicular to the side rack gears 66, and a motor 70 to power the roller gear 68. Here, the roller gear 68 is rollably connected to the rider 18 and rotatably mounted on the side rack gears 66. In this construction, the roller gear 68 is rotatably mounted on the rack gears 66 to allow the rider 18 to make the horizontal reciprocation along the rack gears 66 where the rider 18 is also maintained below the elongated top panel 14 of the base frame 12. Here, a plurality of guider rollers 72 may be formed from each side of the rider 18 to further stabilize the horizontally reciprocal movement of the rider 18 along the rack gears 66. The

roller gear **68** is powered by the second motor **70** fixed to the rider **18**.

For a better performance, a pair of roller coasters **80** parallel to each other and to the rack gears **66** are  
5 attached to the base frame **12** to allow the horizontally moving rider **18** to pass therebetween. The roller coasters **80** are each formed to have a substantially waved top surface **82**. In this construction, a coasting member **84** having a bottom surface **86** and side surfaces **88** is  
10 liftedly engaged to the rider **18**. In a preferred version, the waved top surfaces **82** of the roller coasters **80** each substantially form a curvature of a human spinal cord. Also, a guide roller **90** is formed outwardly extending from the side surfaces **88** of the coasting member **84**. Here,  
15 the guide roller **90** on each of the side surfaces **88** enables the coasting member **84** to make a roller coasting movement on and along the waved top surfaces **82** of the roller coasters **80** while being engagedly lifted from the rider **18** which makes the horizontally reciprocal movement.  
20 Preferably, the coasting member **84** is formed in a container type. On the other hand, elongated guides **92** are provided extending from the bottom surface **86** of the coasting member **84**, and second guide bushes **94** are upwardly formed on the rider **18** to releasably receive the  
25 second elongated guides **92** so as to stabilize the roller

coasting movement of the coasting member **84** along the roller coasters **80** and the lifting of the coasting member **84** from the rider **18**.

As discussed above, an advantage of the present  
5 inventions is that the lie-down massager **10** according to the present invention optimally combines a lengthwise reciprocation of massage bumps **42** with a vertically reciprocal movement and with a widthwise reciprocation of the massage bumps **42** for thereby enabling an evenly  
10 widespread massaging on the back and neck of a patient lying on the massager.

In addition, the combination of the triple reciprocations substantially alleviate pains resulting from the conventional massager using a predetermined  
15 solid pattern along which the rider **18** follows without a vertically allowable resilience, thereby improving product reliability. Further, the coasting member **84** working with the roller coasters **80** to realize an additional lifting by utilizing the horizontally  
20 reciprocal movement of the rider **18** enables the massaging bumps **32** to continue a smooth, steady and robust massaging on the patient together with the triple reciprocations, thereby substantially improving massaging effect and subsequently maximizing customer satisfaction.

Although the invention has been described in  
considerable detail, other versions are possible by  
converting the aforementioned construction. Therefore,  
the scope of the invention shall not be limited by the  
5 specification specified above and the appended claims.